

Remarks

Claim 26 is newly added with this amendment. Claims 1, 4, 5, 8, 12, 17, 21, 24, 25 have been amended. Reconsideration of the present application, as amended, is respectfully requested.

Previously pending claims 1-25

With respect to pending claims 1-25, these claims stand rejected under 35 U.S.C. §112 as failing to comply with the enablement requirement. Applicants have amended independent claims 1, 8, 17, 24 and 25 to more clearly recite the limitations of the present invention. As now amended, the claims are now clearly directed to a local transport interface that maximizes the transfer of traffic across the transport network by adapting transmission rate to reflect available bandwidth. The transmission channel is continuously self-corrected so that the transmitting port always uses the channel across the transport network at its maximum capacity. A higher level protocol is responsible for determining when replacement frames (to replace lost frames) are inserted into the traffic.

With respect to pending claims 23 and 25, these claims also stand rejected under 35 U.S.C. §112 as being indefinite. Applicants were unable to verify that the phrase recited in paragraph 5 of the present Office Action was accurately reproduced because the phrase is not found in the claims as originally presented. However, applicants have attempted to re-draft claim 25 to remove any apparent inconsistency between the phrases “checking for loss” and “without consideration of loss or corruption”. Applicants submit that present amendments to the claims have removed this apparent inconsistency. It is noted that it is not inconsistent to adjust the transmission rate if it is determined that the availability status of the FIFO buffer at the remote port is at least partially empty based on detection of lost frames. By continuously updating buffer availability, the effectiveness utilization of the transmission channel between two ports is now possible.

Dependent claim 26 has been newly added and recites that frame loss or corruption of a transmitted frame is handled by a higher level protocol. This feature is neither shown nor suggested by the cited art of record.

With respect to previous pending claims 1-25, claims 1-4, 8-11 and 15-20 stand rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent Application No. 2003/0074449, published April 17, 2003, R. Smith *et al.* (Smith) in view of U.S. Patent Application No. 2002/0004842, published January 10, 2002, K. Ghose *et al.* (Ghose). Claims 5, 6, 12, 13, 21 and 22 were rejected under 35 U.S.C. §103(a) as being obvious over the combination of the Smith and Ghose patent applications and further in view of U.S. Patent Application No. 2003/0185223, published October 2, 2003, M. Tate *et al.* (Tate).

The independent claims have been amended to more clearly identify the present invention and now more clearly recites the use of a tagged encapsulated client frame or equivalent language. More specifically, the independent claims, as now amended, each describe a mechanism that provides for the efficient transmission of a maximum amount of GFP-encapsulated client data frames across a SONET/SDH transport network in the shortest time possible. In order to maximize the transmission rate, each GFP-encapsulated client data frames includes a tag. Clearly, if the transmitted GFP frames are dropped, or if the acknowledgment tag is lost on the return transmission, the effectiveness of the transmission channel between two port cards (such as port cards 14 and 23) will be reduced. However, with the described and claimed mechanism of the present invention, the reduced effectiveness is only temporarily because as soon as new information is either received or deduced, the transmitting port card self-corrects to continuously and quickly determine the correct amount of buffer available in the buffer at the remote port card. Self-correction is efficiently achieved because there is no need to wait for the responder port to send back an ACK or NACK frame. With this invention, the transmitting port card always uses the channel across the transport network most efficiently and makes up for any lost bandwidth due to dropped GFP frames or tag acknowledgments. This combination of features and benefits is not described in any of the cited art whether considered alone or in combination.

For instance, as previously noted by the Examiner, Smith discloses a buffer-to-buffer flow control using frame counts which is a well known buffer management concept. Ghose teaches buffer-to-buffer credits for implementing flow control based on the number of bytes that have been sent by the sending port over a packet oriented transmission network. While Ghose discloses that credits (buffer-to-buffer credits) are issued from the receiver to the sender prior to data transmission, Ghose does not suggest, either alone or in combination with the other cited art,

a mechanism for adjusting the flow if transmitted data is lost. As such, the cited art lacks completely any mechanism for adjusting the transmission rate from the sender to the receiver based on transit time and availability of buffer-to-buffer credits without causing buffer overflows. It is also quite clear that Smith and Ghose, either alone or in combination, lack an effective mechanism that enables the sender to compensate for lost or dropped client frames. Specifically, if receipt of a NACK is delayed or lost, there is no mechanism for adjusting the transmission rate.

With the present invention, the round trip time for receipt of tagged encapsulated client frames allows the sender to adjust the credit account based on knowledge obtained from the returned tag. This claimed feature is missing from the cited art even if Smith and Ghose were combined with Tate. Tate discloses the use of IEEE 802.1q tags where a “tag” field is added to Ethernet frames to indicate in which VLAN they are supposed to go. The resulting combination of the tag as suggested by Tate when combined with the transmitter port of Smith in view of Ghose would result in a completely different system from that described in the claimed invention. Specifically, the tags are not intended to monitor bandwidth of the transport network. This combination of cited art references does not provide the features and benefits of the present invention as now claimed.

Similarly, combining Smith and Ghose with Kirchner et al., U.S. Patent No. 5,745,685 (Kirchner) does not arrive at the novel combination of the present invention. While many prior art references use a timer for various applications, the cited references do not use a timer to monitor bandwidth utilization. In Kirchner, the timer is a service-defined time delay that is arbitrarily chosen. This type of timer is inherently inefficient and if the timer of Kirchner were combined with Smith and Ghose, it would likely degrade transmission across the network because the Kirchner timer’s start and end values are not appropriately chosen. There is no teaching to monitor round trip transit time of the tag and thereafter, set the timer to identify when a tag has been lost. Moreover, even if combined, the resulting combination of the Kirchner timer, the transmitter port of Smith in view of Ghose would not provide an efficient way of confirming that a message sent by the transmitter to the receiver has been received but for a single network configuration. This combination is clearly not adaptive to various network topologies.

Conclusion

Therefore, the applicants respectfully submit that the claims as now amended are patentable and that the case is in condition to be passed to issue. If a telephone conference would in any way expedite the prosecution of the application, the Examiner is asked to call the undersigned at (408) 868-4088.

Respectfully submitted,
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